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EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS  
ON THE NATIONAL FORESTS IN MISSISSIPPI

by

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INTRODUCTION

During August and September 1977, Forest Insect and Disease Management conducted southern pine beetle evaluations on the Bienville National Forest, the Tombigbee National Forest, the Chickasawhay District of the DeSoto National Forest, and the Homochitto National Forest. The purpose of these evaluations was to describe the current southern pine beetle outbreak.

The history of the southern pine beetle in Mississippi dates back to the early 1950's when the southwest portion of the state recorded severe infestation levels. For instance, between 1952 and 1955, nearly 75,000 MBF of timber was salvage removed from the Homochitto National Forest. The outbreak decreased on the Homochitto during the late 1950's, then increased during the 1960's.

The southern pine beetle first appeared on the Chickasawhay District of the DeSoto National Forest during the winter of 1975. Since that time, over 130 MBF of sawtimber, and 1,158 CCF of pulpwood have been salvage removed.

Farther north in the State, southern pine beetle activity was also increasing. The Bienville National Forest detected major infestations during the fall of 1976. These infestations, preceded by a build-up of Ips populations (Roger and Twardus, 1976), blossomed into a major outbreak resulting in nearly 3,000 MBF of timber being salvage removed and nearly 5,000 infested stems being chemically treated during the past year.

In the northeast portion of the State, southern pine beetle activity has been relatively rare until the early spring of 1977. At that time southern pine beetle activity increased on the Tombigbee National Forest, resulting in over 350 MBF of sawtimber and 105 CCF of pulpwood being salvage removed this year.

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Currently, none of the National Forests in Mississippi have outbreaks of the extent that occurred on the Homochitto N.F. during the early 1950's. However, considering that the southern pine beetle has appeared in areas previously unaffected, and that in many of these areas overstocked stands are common, the potential does exist for severe and widespread losses to occur.

The southern pine beetle, it must be remembered, does not magically appear in pine forests. Research has shown that outbreaks are related to predisposing stand conditions such as overstocked, overmature stands, or stands stressed by excess moisture, drought, or weakened by storms or lightning. Southern pine beetle populations build up in these stressed stands, then move to surrounding healthy stands.

#### METHODS

Standard aerial sketch map procedures were used to detect infestations. In all cases, surveys were 100 percent coverage. Data were not corrected for observer error.

A percentage of the infestations were visited on the ground by Forest Insect and Disease Management personnel. Infestations were chosen for ground checks on a random basis.

Results of the aerial surveys and ground checks were combined to estimate a total volume affected by the southern pine beetle for that particular month. Because of the biotic potential of southern pine beetle (6 - 7 generations per year) in Mississippi, this volume affected does not represent a true picture of the potential of the southern pine beetle for a full year -- rather it portrays, at best, two months of possible control activity.

#### RESULTS

Summarized data for all Forests appear in Table 1.

##### Homochitto National Forest -

Overall southern pine beetle activity has decreased since last year. In August 1976, 1,453 infestations were detected with at least 70 percent being single-tree infestations (Rogers, 1976). August 1977 showed 300 infestations with at least 50 percent being single-tree infestations. Many of the infestations, especially on the Homochitto District, go inactive before control operations can be initiated. This is reflected in the green-fresh attack to red and fading infested ratio of 1:1.85 found on this district.

Table 1. Summary of results of southern pine beetle evaluation conducted on the National Forests in Mississippi, August and September 1977

|  | Ownership Unit          |                       |                         |                         |
|--|-------------------------|-----------------------|-------------------------|-------------------------|
|  | Bienville               | Tombigbee             | Homochitto              | DeSoto                  |
| 1. Results compiled from data collected during the aerial phase of the evaluation:             |                         |                       |                         |                         |
|  |                         |                       |                         |                         |
| Survey type . . . . .  |                         |                       |                         |                         |
| Date of aerial survey . . . . .  | 8/3/77                  | 9/8/71                | 8/4/77                  | 8/10/77                 |
| Percent survey . . . . .   |                         | 100%                  |                         |                         |
| Total acreage surveyed . . . . .   | 382,820                 | 119,155               | 373,497                 | 238,432                 |
| Total acreage of Forest Service land . . . . .   | 177,070                 | 65,550                | 188.92                  | 150,225                 |
| Susceptible host type acreage Forest Service land . . . . .                                    | 137,805                 | 46,541                | 151,193                 | 126,189                 |
| Total number of spots . . . . .  | 136 (240) <sup>1/</sup> | 35 (72) <sup>1/</sup> | 169 (300) <sup>1/</sup> | 110 (219) <sup>1/</sup> |
| Spots per Acres of host type Forest Service land . . . . .                                     | 1.74                    | 1.54                  | 1.98                    | 1.74                    |
| Average spot size (trees) Forest Service land . . . . .  | 18 trees                | 15 trees              | 10 trees                | 10 trees                |
| Range of spot sizes Forest Service land . . . . .  | 1-2000                  | 1-300                 | 1-30                    | 1-25                    |
| 2. Results compiled from data collected during the ground and aerial phases of the evaluation: |                         |                       |                         |                         |
|  |                         |                       |                         |                         |
| Date of ground phase . . . . .   | 8/10/77                 | 9/13/77               | 8/9/77                  | 8/20/77                 |
| Infested trees per M acres host type Forest Service lands . . . . .                            | 57                      | 19                    | 11                      | 5                       |
| Ratio green infested to red and fading infested trees . . . . .                                | 1.9:1                   | .9:1                  | 1:1.5                   | 1:1.74                  |
| Total volume of infested trees on Forest Service lands . . . . .                               | 1,692 MBF               | 147 MBF               | 507 MBF                 | 104 MBF                 |
| Total volume affected on Forest Service lands . . . . .  | 2,400 MBF               | 230 MBF               | 899 MBF                 | 270 MBF                 |
| Total volume affect all Forests August 1977:   |                         |                       | 3,800 MBF.              |                         |

<sup>1/</sup> Number in parentheses indicates total number of spots if corrected for observer error, according to R. C. Aldrich, R. C. Heller, and W. F. Bailey. 1958. Observation limits for aerial sketch mapping southern pine beetle damage in the Southern Appalachians. J. For. 56(3):200-203.

DeSoto National Forest, Chickasawhay Division -

Southern pine beetle activity on this forest has also decreased since last year. In August 1977, 219 infestations were detected with at least 50 percent being single trees. Last year 241 infestations were detected in August, with at least 66 percent being single trees (Rogers, 1976). The ratio on green-infested to red and fading infested on this forest is 1:1.74, which as on the Homochitto, indicates a decrease in spot growth.

Bienville National Forest -

Southern pine beetle activity has increased to high levels. Since the outbreak was first detected in the fall of 1976, over 2,912 MBF of timber have been salvage removed. In addition, 4,287 infested stems have been chemically treated.

At the time of the evaluation, there were 240 infestations ranging in size from single trees to those with over 2,000 affected trees.

Southern pine beetle populations appear to be very active on the Bienville National Forest. This is indicated by the ratios of green-fresh attacks to red and fading infested; 2:1 on the Bienville District and 1.8:1 on the Strong River.

Chemical treatment operations began on the forest in June of 1977. This allowed treatment of infestations that previously have been left due to inaccessibility or inoperability from a salvage standpoint.

Tombigbee National Forest -

Southern pine beetle activity on the Tombigbee varies among districts. The Ackerman Unit has experienced increased activity since the outbreak began in the spring of 1977, while the Trace and Yolabusha Units have continued low activity.

During the September evaluation of the Tombigbee, 72 southern pine beetle infestations were detected on the Ackerman, while less than 20 were detected on both the Yolabusha and Trace Units combined. Many of the infestations detected on the Ackerman Unit were found to be much larger upon ground examination. The green-infested to red and fading infested ratio for the Ackerman was found to be .9:1.

Five active southern pine beetle infestations were visited on the Ackerman Unit. Of those, four occurred in stands with pine basal areas per acre in excess of 130 sq ft/ac, and average pine d.b.h. of 10 inches or more. Research has shown that southern pine beetle infestations are more likely to occur and develop more rapidly in heavily stocked stands.

## DISCUSSION

This evaluation cannot predict with any certainty what southern pine beetle levels will be on any of the forests during the coming year. It does, however, indicate that southern pine beetle populations are increasing on both the Bienville and Tombigbee National Forests. The Homochitto and DeSoto National Forests have declining populations, but these populations do not appear to be collapsing.

Overall, it is expected that salvage figures for all project areas combined will range between 7,000 MBF and 10,000 MBF. This anticipates an increase of 2 - 5 fold of the present estimated volume affected of 3,800 MBF. This increase in volume lost would be caused by both expansion in size of present infestations and by proliferation (or the appearance of new infestations) throughout the year.

## RECOMMENDATIONS

1. Salvage removal of infested timber should continue on all forests. This should be done in accordance with the procedures outlined in FSM 5250.
2. Chemical treatment of infested trees should be used to control active infestations that cannot be salvage removed or piled and burned. Chemical treatment should be done in accordance with FSM 5250.
3. Direct control of the southern pine beetle either by salvage removal, chemical treatment, or both, will not alone alter the frequency of beetle outbreak or affect the severity of the outbreak. Effective pest management requires the integration of those practices designed to avoid outbreaks. To avoid southern pine beetle outbreaks, predisposing stand conditions, such as overstocked stands, stands weakened by excess moisture or drought, or damaged by storms, should have these conditions modified or eliminated.

## REFERENCES

Rogers, Terrence J. 1976. Evaluation of the southern pine beetle infestations on the National Forests in Mississippi. USDA, USFS, SA, S&PF, FI&DM, Report No. 76-2-21.

Rogers, Terrence J. and D. Twardus. 1976. Evaluation of southern pine beetle infestations on the Bienville National Forest, Mississippi. USDA, USFS, SA, S&PF, FI&DM, Report No. 77-2-2.

POST SUPPRESSION EVALUATION  
OF THE  
NATIONAL FORESTS IN MISSISSIPPI

by

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INTRODUCTION

The purpose of this evaluation is to help the forest and districts with southern pine beetle suppression projects evaluate their FY 77 project. It is an attempt to summarize reported accomplishment and to document the successes and problems encountered by the districts while doing SPB suppression work. It is hoped that by reviewing past projects, better decisions can be made concerning project planning, organizing, directing, and controlling. This may also help in future target setting, fund allocation, and accomplishment reporting.

The National Forests in Mississippi had a Southern Pine Beetle Control Project in FY 77. The targeted amount of salvage was 3,272 MBF. It was estimated that 10,000 stems would need to be chemically treated to help effect control. To do this, presuppression flights covering 5,840,000 acres were planned. The total estimated cost for the project was \$100,658. This funding was received in June 1977 (5200-10 dated 2/22/77). Table 1 contains a comparison of project targets versus reported accomplishments.

Target Setting and Insect & Disease Management Reporting System (IDARS)

Project Proposals were submitted for each Forest where SPB was expected to be a problem. Salvage control (MBF), chemical control (stems), and presuppression (acres) targets were set up based on current entomological knowledge. Although some estimates can be made, SPB activity cannot be accurately predicted a year in advance. For this reason, the estimated targets may not reflect what actually happened on a forest during the project year.

The project took into account funding for presuppression flights, chemical control, salvage control, and indirect services of the Supervisor's Office. When the reported accomplishment figures do not match the targets set forth in the Project, it may be due to a change in SPB activity over the course of the year, to inconsistencies in

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Table 1. Project accomplishments as reported on IDARS

| Target Areas             | Bude     | Homochitto                                  | Bienville                 | Strong River |
|--------------------------|----------|---|---------------------------|--------------|
| Stems chemically treated | --       | --  | 1,153                     | 4,020        |
| Presuppression acres     | 276,000  | 679,000                                     | 432,500                   | 635,110      |
| Salvage MBF              | 2,443.00 | 2,741.75                                    | 1,466.70                  | 1,165.00     |
| Funds spent              | --       | --  | \$ 6,022.00               | \$ 12,950.00 |
|                          |          |   | Chickasawhay              | Ackerman     |
| Stems chemically treated |          | 676   | --                        |              |
| Presuppression acres     |          | 1,950,000                                   | 85,600                    |              |
| Salvage MBF              |          | 146.27                                      | 1,162.3                   |              |
| Funds spent              |          | \$ 2,545.00                                 | \$ 4,000.00               |              |
| Totals:                  |          | Project targets                             | Data as reported on IDARS |              |
| Funding available        |          | \$ 31,842 (85,560-<br>53,718) <sup>1/</sup> | \$ 25,517                 |              |
| Salvage                  |          | 3,272 MBF                                   | 12,225 MBF                |              |
| Chemically treated       |          | 10,000 Stems                                | 5,849 Stems               |              |
| Presuppression acres     |          | 5,840,000                                   | 4,058,310                 |              |

<sup>1/</sup> This amount went directly to districts. Indirect charges were an additional \$15,098. The National Forests in Mississippi also returned \$53,718 unused for FY 77. Original project funding was \$100,658.

accomplishment reporting, or to districts not able to get the work done. Some reasons for not accomplishing the work include inoperability, poor markets, few operators, late funding and district commitment to do the work.

Project accomplishment is reported on IDARS. These forms are designed to show how SPB control work is being accomplished on a monthly basis. If accomplishment reporting problems become apparent, FI&DM should give adequate training to insure that districts know how to report project accomplishment correctly.

#### Funding -

Southern pine beetle project funding was received by the National Forests in Mississippi in June 1977. The timing was not conducive to the efficient operation of the SPB control effort. Approximately one-half the funding was returned unused. Efficient control work cannot be expected when funding is made available with only four months remaining in the project year.

#### Market Conditions -

Market conditions varied during FY 77. The Ackerman District had problems selling pulpwood. The operators are willing to take the wood, but the pulpwood dealers periodically stopped taking wood due to low demand. Elsewhere, the market was generally stable in FY 77. The problems are usually concerned with the availability of operators willing to do salvage control work on small spots.

#### Operator Reliability -

The Ackerman District reported some problems with operator reliability. Excessive slash, poor log banking decisions and incorrect log road construction were the main problems. District personnel were given a SPB training session by FI&DM during June 1977. This is the first year the district had experienced SPB problems. Many of the problems with salvage control procedures were addressed at the SPB training session. Post suppression checks are now done properly. Poor operator efficiency was corrected by the better monitoring of operators throughout each salvage control operation. Post suppression checks and operator training were essential ingredients in completing SPB control measures satisfactorily.

Homochitto - The Homochitto District primarily salvaged sawtimber in FY 77. The major problem with operators on this district is to get them to remove pulpwood size timber that was sometimes associated with sawtimber salvage sales. There were few problems with breakouts in FY 77. Post Control checks and operator supervision insured that a complete salvage control operation was performed on most spots. The salvage control effort was satisfactory in FY 77.

Bude - Most salvage control work in FY 77 was done in sawtimber type spots. Salvage control work here was closely supervised and as a result, there were few problems with breakouts. Adequate operators were present to handle the volume necessary for SPB control. Salvage control efforts on this district were satisfactory in FY 77.

Bienville - Chemical treatment was used on the smaller inoperable spots on this district. This enabled the salvage effort to be directed at the larger spots. Hydraulic sprayers were used to chemically treat since this reduces manpower needs. Each timber operator had an area in which he did salvage control work. This allows better control work since it is easier to supervise the operators in this type of sales system. Post control checks are done as required. The overall control effort on this district is excellent.

Strong River - The Strong River District also used the area type of sales system in coordinating control work. Hydraulic sprayers were also used on spots that were of low salvage priority, inaccessible, or not saleable due to size of spot. The effort to control SPB here is similar to that of the Bienville District. Both districts have similar results -- the SPB control effort here is excellent.

Chickasawhay - Most of the salvage control work done on this district was done in pulpwood size timber. The market for pulpwood is good in this area because of the proximity of paper mills. Operators are numerous and familiar with SPB control work. Most problems lie in getting bids on small sawtimber sales. The operators' work here is satisfactory for SPB control.

#### Personnel -

Temporary personnel are taken on when an extreme effort is needed to achieve chemical control. The funding in FY 77 was not provided early enough for personnel to be hired if needed.

#### Unit Plans -

Some Forests now have direct control and prevention statements in the Timber Management Plans starting in FY 78. Many districts have pine stands which are overstocked and need remedial silvicultural treatment soon to avoid further SPB epidemics. The Tombigbee National Forest and the DeSoto National Forest have recently written Timber Management Plans. Long range insect and disease management planning was included in these documents and should be implemented in FY 78. Other National Forests in Mississippi will be addressed as the Timber Management and Unit Plans are written.

Timber Sales -

The majority of the timber sales on the National Forests in Mississippi that are concerned with SPB control work are administered on an area basis. Timber operators bid on the salvage timber. The winning bidders are then given a predetermined area in which to do all their salvage work. One problem with this method is that when a SPB epidemic is underway, only the larger timber operators have the men and means to do quick efficient work on a large scale.

Conclusion -

Late project funding in FY 1977 made impossible much of the SPB control work that was needed.

Post suppression checks and operator supervision have kept breakouts to a minimum. It should be noted here that the Post Control check is essential to effective SPB control work. Districts which make the effort to do this properly greatly increase the efficiency of their work.

Preventative measures will be initiated for the Tombigbee and DeSoto National Forests when the Unit Plans take effect in FY 78. As other forests write Unit Plans, FI&DM will assist the forest and districts in long range insect and disease management planning.